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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/575,346	04/11/2006	Takamitsu Saito	NNA-115-B	3501
48980	7590	05/20/2010		
YOUNG BASILE 3001 WEST BIG BEAVER ROAD SUITE 624 TROY, MI 48084			EXAMINER HAILEY, PATRICIA L	
			ART UNIT 1793	PAPER NUMBER
			NOTIFICATION DATE 05/20/2010	DELIVERY MODE ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

docketing@youngbasile.com  
audit@youngbasile.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/575,346	<b>Applicant(s)</b> SAITO ET AL.	
	<b>Examiner</b> PATRICIA L. HAILEY	<b>Art Unit</b> 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 25 February 2010.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-12 and 14-18 is/are pending in the application.
- 4a) Of the above claim(s) 11, 12 and 14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 and 15-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on April 11, 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/17/2006</u> .  | 6) <input type="checkbox"/> Other: _____                          |

***Election/Restrictions***

1. Applicant's election of Group I, claims 1-10 and 15-18, in the reply filed on February 15, 2010, is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Applicants' election "is made to further prosecution only and is not to be construed as agreement with the Examiner's position regarding claim 11 or any other claim."

It has come to the Examiner's attention that claim 14 was inadvertently omitted from the previous restriction requirement. Claim 14 should have been grouped with claim 12, as it was previously grouped with claim 12 in the original restriction requirement of October 20, 2009.

Claims 11, 12 and 14 are hereby withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected electrode (claim 11) and battery/vehicle (claims 12 and 14), there being no allowable generic or linking claim.

Claims 1-10 and 15-18 are under consideration by the Examiner.

***Priority***

2. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Applicants' Priority Documents were filed on April 11, 2006.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
  2. Ascertaining the differences between the prior art and the claims at issue.
  3. Resolving the level of ordinary skill in the pertinent art.
  4. Considering objective evidence present in the application indicating obviousness or nonobviousness.
5. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

**6. *Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherson (WO 01/80338).***

Scherson teaches a method of fabricating a microbattery (as well as the formation of electrode/electrolyte/electrode assemblies, see page 6, lines 1-3), comprising the steps of depositing droplets of a first electrode material onto a substrate (“base material”) using a microdispensing device (e.g., an ink-jet printer, “ink-jet device”), and depositing droplets of an electrolyte material onto said deposited electrode material. See claims 1 and 3 of Scherson.

Figure 4 of Scherson depicts the formation of a microbattery, wherein a substrate (formed by patterning metal layers onto smooth glass or silicon, “collector”, claim 3) is provided, and an anode, an electrolyte comprised of a polymer solution (“binder material”, claim 1), and a cathode are all applied via in-jet printing using independent ink-jet heads. See page 7, lines 3-14 of Scherson.

Scherson further teaches that inks useful in fabricating microbatteries contain components such as lithiated transitional metal oxides and carbon, and also preferably comprise a dispersant such as an acrylic copolymer and a resin such as polyvinyl butyral, dissolved in an alcohol mixture. For materials for preparation of Li<sup>+</sup> electrodes, materials such as small particles of oxides, sulfides, or carbon as active materials, high area carbon as a conductivity enhancer, and a polymeric binder are employed. See page 7, lines 15-29 of Scherson. This disclosure is considered to read upon the limitations “first electrode ink composition”, “second electrode ink composition”, “electroconductive material”, etc., as recited in claims 1 and 2.

Scherson does not explicitly disclose the formation of an “electrode catalyst layer”, as instantly claimed. However, because this reference teaches the formation of a microbattery via method steps comparable to that instantly claimed, and also discloses the employment of materials corresponding to Applicants’ claimed first and second electrode ink compositions, the skilled artisan would have found it obvious to form an electrode catalyst layer by performing the method of Scherson, absent the showing of convincing evidence to the contrary.

***7. Claims 1-6, 8, 10, and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO 01/80338).***

Regarding claims 1, 2, 10, 15, and 17, Ito teaches the formation of electrode materials comprising either (1) a rubber-based emulsion, activated carbon particles, conductive particles and a surfactant, or (2) a dispersion of PTFE, activated carbon particles conductive particles and a surfactant, wherein the solid content is 25% by weight or more, said electrodes produced by forming an electrode layer on a conductive substrate “by any method without limitation, such as application methods”, such as spraying. See paragraphs [0024]-[0026], [0093], and [0096] of Ito.

Regarding claim 3, Ito teaches: “Known materials useable as collectors in carbon electrodes, etc. are preferably used as conductive substrates.” See paragraph [0094] of Ito.

Regarding **claims 4-6**, Ito teaches nonionic surfactants, such as sucrose fatty acid esters and polyoxyethylene alkyl ethers, as exemplary surfactants. See paragraph [0053] of Ito.

Regarding **claims 8 and 18**, Ito teaches that the content of surfactant in the electrode is not limited, but is generally about 0.1 to about 5% by weight, per 100% by weight of the electrode material. See paragraph [0056] of Ito.

Regarding **claim 16**, Ito teaches that the mean particle diameter of the conductive particulates can be appropriately determined without limitation within the range of 0.01 to 20  $\mu\text{m}$ , see paragraph [0046] of Ito.

Although Ito teaches that the electrodes can produced by forming an electrode layer on a conductive substrate “by any method without limitation, such as application methods”, Ito does not explicitly disclose the steps of ejecting droplets, as recited in **claim 1**.

Scherson teaches a method of fabricating a microbattery (as well as the formation of electrode/electrolyte/electrode assemblies, see page 6, lines 1-3), comprising the steps of depositing droplets of a first electrode material onto a substrate (“base material”) using a microdispensing device (e.g., an ink-jet printer, “ink-jet device”), and depositing droplets of an electrolyte material onto said deposited electrode material. See claims 1 and 3 of Scherson.

It would have been obvious to the skilled artisan to modify the teachings of Ito by employing the method disclosed in Scherson, to effectively form the electrode

layer on the conductive substrate, as Scherson teaches an exemplary “application method” encompassed by Ito.

**8. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO 01/80338) as applied to claims 1 and 4 above, and further in view of Ito et al. (U. S. Patent No. 6,447,571).**

Ito in view of Scherson is relied upon for their teachings with respect to claims 1 and 4. Although the combined teachings of these references, more particularly, Ito, teach the presence of a surfactant, Ito does not teach or suggest the HLB value of said surfactant.

Ito et al. is relied upon to show that nonionic surfactants such as polyoxyethylene mono- or dialkyl ethers and sucrose fatty acid esters (also disclosed in Ito, see paragraph [0053]) can have an HLB in the range of 3 to 20. See col. lines 15-28 and lines 38-52 of Ito et al.

Motivated by the teachings of Ito et al., the skilled artisan would have found it obvious to reasonably expect the nonionic surfactants of Ito to exhibit an HLB in the range of 3 to 20, given that both Ito et al. and Ito disclose the same nonionic surfactants.

**9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ito (U. S. Patent Application Publication No. 2005/0116375) in view of Scherson (WO**



***01/80338) as applied to claim 4 above, and further in view of Shimizu et al. (U.S. Patent No. 5,707,763).***

Ito in view of Scherson is relied upon for their teachings with respect to claims 1 and 4. Although the combined teachings of these references read upon Applicants' claims regarding the "electrode active material" and "first electrode ink composition", neither reference teaches "at least one of a Li-Mn oxide compound and a Li-Ni oxide compound".

However, Scherson teaches that inks useful in fabricating microbatteries contain components such as lithiated transitional metal oxides. See page 7, lines 15-29 of Scherson.

Shimizu et al. is relied upon for its teachings that it is known in the art to employ materials such as lithium nickel oxide and lithium manganese oxide as positive electrode active materials in the formation of electrode compositions. See col. 6, lines 14-19 of Shimizu et al.

It would have been obvious to the skilled artisan to modify the teachings of Ito in view of Scherson by incorporating therein materials such as lithium nickel oxide and lithium manganese oxide, motivated by the teachings of Shimizu et al., as these materials fall within the phrase "lithiated transitional metal oxides", as disclosed by Scherson.

*Conclusion*

10. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to PATRICIA L. HAILEY whose telephone number is (571)272-1369. The examiner can normally be reached on Mondays-Fridays, from 7:00 a.m. to 3:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Melvin C. Mayes, can be reached on (571) 272-1234. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 1700 Receptionist, whose telephone number is (571) 272-1700.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/PATRICIA L. HAILEY/  
Primary Examiner, Art Unit 1793  
May 17, 2010